

REMARKS/ARGUMENTS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. This amendment is in response to the Office Action mailed July 1, 2005. Claims 1-29 were rejected. Claims 1-7, 12-29 have been amended to address the concerns raised by the Examiner. Claims 1-29 remain pending in the application.

Claim Rejections - 35 U.S.C. § 112

Claims 28 and 29 stand rejected under § 112, 2nd paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The dependency of claims 28 and 29 has been corrected as noted by the examiner.

Claim Rejections - 35 U.S.C. § 102

Claims 1, 5, 20 and 23 (including independent claims 1 and 20) stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent. No 4,823,908 to Tanaka et al. (hereinafter "*Tanaka*"). In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to independent claims 1 and 20 with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

Amended claim 1 is directed to a method of generating parametric audio output including the use of "an electro acoustical transducer film diaphragm". In contrast, *Tanaka* teaches the use of a ceramic piezoelectric vibrator having a diameter of 9.7 mm (col 7, lines 2-3). *Tanaka* fails to disclose a film diaphragm. Moreover, *Tanaka* teaches that "[b]ecause of a low conversion efficiency, an extremely powerful ultrasonic wave is required to reproduce an audible sound of practically acceptable level" in a parametric speaker (col. 1, lines 42 – 45). Therefore, *Tanaka* would require a very high power transducer as part of a parametric speaker. Prior art film emitters in general (linear) sound applications have been recognized as low power devices. *Tanaka* therefore teaches against the consideration of a film transducer for parametric use. Applicant therefore respectfully submits that claim 1, and dependent claims 2-19 and 26-27 are allowable over *Tanaka* for at least this reason.

Amended claim 20 is directed towards a speaker device for generating parametric audio output using an “electro acoustical transducer film diaphragm.” Claim 20, and dependent claims 21-25 and 28-29 are therefore allowable over *Tanaka* for at least the above reason.

Claims 1, 5, 20 and 23 (including independent claims 1 and 20) stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent. No 5,357,578 to Taniishi et al. (hereinafter “*Taniishi*”).

Amended claim 1 is directed to a method of generating parametric audio output including the use of a “a film diaphragm which couples directly with the air as part of a single stage energy conversion process.” *Taniishi* fails to disclose a “single state energy conversion process.” In particular, *Taniishi* teaches the use of a silicone gel to induce the non-linear interaction of ultrasonic waves to generate the parametric audio output (col. 3, lines 27-31). Moreover, *Taniishi* teaches away from emitting the ultrasonic waves into the air by including an acoustic absorber to absorb the ultrasonic waves before emission into the air (col. 3, lines 31-34; FIGS. 1, 3). Accordingly, *Taniishi* fails to teach “emitting the ... ultrasonic signals ... into the air” as claimed in claim 1. Claim 1, and dependent claims 2-19 and 26-27 are therefore allowable over *Taniishi* for at least this reason.

Claim 20 contains similar limitations as claim 1, and therefore claim 20, and dependent claims 21-25 and 28-29 are allowable over *Taniishi* for at least the above reason.

Claim Rejections - 35 U.S.C. § 103

Claims 2, 4, 7, 12, 13, 21, 24 and 26-29 stand rejected under 35 U.S.C. §103(a) as unpatentable over Tanaka in view of U.S. Patent No. 5,287,331 to Schindel (hereinafter “*Schindel*”).

The Examiner has asserted that “[o]ne skilled in the art would have expected that any specif[ic] design of the ultrasonic transducer could be used without generating any unexpected result” and thus “it would be obvious to one of ordinary skill in the art to modify *Tanaka* in view of *Schindel* by using the piezoelectric film electrostatic transducer.”

Applicant respectfully maintains that one of skill in the art would not expect that any design of ultrasonic transducer would be appropriate in embodiments of the present invention. The teachings of the prior art in parametric transducer systems, as exemplified by *Tanaka*, is that high-energy output is required to create the power required to drive the air medium to a nonlinear state to develop the parametric audio signal. To achieve such high output has, as taught by *Tanaka*, typically been achieved by using a large number of individual transducers. Prior art film emitters in general (linear) sound applications have been recognized as low power devices. Accordingly, both *Tanaka* and the general prior art of linear audio systems teach against the consideration of a film transducer *in a parametric system*.

Furthermore, film emitters used in audio applications have been limited to linear systems that produce sound directly, in a conventional manner, and have not been applied as part of a parametric speaker. Although *Schindel* teaches an ultrasonic system, the disclosed system is also a linear system. One skilled in the art would not consider that a sound system based on conventional *linear* mode operation would provide obvious teachings for implementation in a *nonlinear* sound system, such as *parametric sound*. It would be recognized that sound production and control of distortion and related technical issues would be significantly different for a nonlinear system as compared to a linear system. Accordingly, the lack of suggestion that film could be effectively *used as a parametric emitter* and the differences between conventional sound systems operating in a linear mode, versus parametric sound systems that only operate where the air is driven to a nonlinear mode, would not suggest the present invention as claimed to one of ordinary skill in the art

Claims 3, 6, 22, and 25 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Tanaka* in view of U.S. Patent No. 4,908,805 to Sprenkels et al. (hereinafter “*Sprenkels*”). As for *Schindel* above, *Sprenkels* fails to provide any teachings for use of a film transducer *in a parametric system*. Furthermore, Applicant notes that *Sprenkels* teaches a very small emitter size, on the order of several hundred microns on a side (col. 9, lines 47-51), compatible with manufacture using IC processing technology (col. 3, lines 3-10). This comports with the conventional wisdom, as exemplified by *Tanaka*, that the ultrasonic emitter area should be small,

e.g. on the order of the ultrasonic wavelength to be emitted. In contrast, the present invention enables the use of large area film emitters many wavelengths in size, e.g., as claimed in claim 13.

Claims 4, 8, 9, 10, 11, 15, 16, 18, and 19 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Tanaka* in view of U.S. Patent No. 4,056,742 to Tibbets et al., (hereinafter “*Tibbets*”). *Tibbets* does not teach either the use of a film transducer for ultrasonic frequencies or the use of a film transducer *in a parametric system*.

Claims 4 and 17 stand rejected under 35 U.S.C. §103(a) as unpatentable over *Tanaka* in view of U.S. Patent No. 4,784,915 to Sakegami et al., (hereinafter “*Sakegami*”). As for *Schindel* above, *Sakegami* fails to provide any teachings for use of a film transducer *in a parametric system*.

Accordingly, Applicant requests the examiner to reconsider and withdraw the objections based on 35 U.S.C. §103(a).

Claim Rejections – Double Patenting

Various claims of the present application stand rejected under the judicially created doctrine of double patenting over various issued U.S. Patents. Applicant requests the Examiner to reconsider these rejections in light of the amendments and arguments above.

Please also note that the rejection over claim 1 of U.S. Patent No. 6,299,899 in view of *Taniishi* (paragraph 14 of the Office Action) appears to be in error. U.S. Patent No. 6,299,899 is directed to an entirely different subject matter than the present invention.

CONCLUSION

In light of the above, Applicant respectfully submits that pending claims 1-29 are now in condition for allowance. Therefore, Applicant requests that the rejections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims

remains after entry of this Amendment, the Examiner is requested encouraged to call Steve M. Perry at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 30th day of September, 2005.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Steve M. Perry". The signature is fluid and cursive, with the first name "Steve" and last name "Perry" clearly distinguishable.

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